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Mobile Missile Verification Issues

Preface

This paper considers the issues involved in monitoring mobile missiles in a SALT Two agreement. This paper does not address the issue of banning or permitting mobile basing options; rather it works from the premise that mobile options are permitted and focusses on the problems of mobile missile verification. The paper examines the problem of monitoring the various basing options and analyzes collateral constraints or counting rules to enhance verification.

Background

Since early in the Strategic Arms Limitation Talks, the US has taken the position that mobile missiles present a more difficult verification problem than do SLBMs or fixed ICBMs. In SALT One the US argued that, because of these verification problems, land-mobile missiles should be banned. The Soviets termed US concerns "artificial" and rejected the proposal to ban land-mobile missiles. Subsequently, the US fell back to a unilateral statement that we would "consider the deployment of operational land-mobile ICBM launchers during the period of the Interim Agreement as inconsistent with the objectives of that agreement."

The Vladivostok accord does not discuss land-mobile ICBMs specifically. It is implicit in this omission and in the provision to count "land-based ICBM launchers" that either party may deploy them. The agreement does cover air-to-surface missiles with ranges over 600 kilometers carried on bombers.*

The Soviet draft agreement would ban air-mobile ICBMs on aircraft other than bombers, and sea-surface

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The US position is that this provision relates only to air-to-surface ballistic missiles and excludes cruise missiles.

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mobile ballistic missiles. The U.S. draft permits and counts air-mobile ICBMs, and both drafts permit and count land-mobile ICBMs. The U.S. draft includes a counting rule to eliminate the potential ambiguity which could arise if land-mobile IRBM launchers are deployed which are similar to those for ICBMs. It also bans storage of excess missiles in the vicinity of the launcher.

Soviet Mobile-Missile Program

Land-Mobile Missiles

The Soviets have experimented with mobile ballistic missile systems since the Fifties. Four land-mobile systems have been tested -- the SS-1 Scud, SS-12 Scaleboard, SS-14 Scamp and SS-X-15 Scrooge. Only the SS-1, a tactical missile with a range of 160 nm, and the SS-12, with a range of about 500 nm, were ever deployed. Development of the SS-14 with a range of about 1600 nm and the SS-X-15 with a range in excess of 3,000 nm stopped short of deployment.

SS-12 Scaleboard units are deployed at three locations near the China border. Isolated pieces of Scaleboard equipment have been [REDACTED] at several other military districts in the Soviet Union that border other countries. Although the extent of this deployment can not be determined, it has been estimated that a total of 80-120 launchers are deployed. Scaleboard units are normally in garrison and deploy to the field only in alerts or exercises. Until 1973, it was estimated that Scaleboard units probably had nine launchers. [REDACTED]

[REDACTED] Information in 1972 indicated that the units have 12 launchers, and consist of three battalions, each with two batteries of two missile launchers.

SS-4 MRBMs deployed at soft launch sites are transportable and these units occasionally exercise at fixed field sites. The fixed field sites vary from about 5-25 miles from the permanent launch site. They consist of four launch positions, however, all missile related equipment apparently is brought with the units from the

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permanent sites. There are more than 100 field sites in the Soviet Union, although some no longer appear to be used. [REDACTED]

An [REDACTED] indicated that the Soviets intended to fire the initial missiles from the permanent soft sites and then the units would move to the field sites for additional launches. Until recently we had estimated that there were at least two missiles for each soft SS-4 launcher. However, [REDACTED] evidence that there are three-four missiles per launcher.

The new Soviet solid-propellant SS-X-16 ICBM probably is being developed in both silo-launched and land-mobile versions. We believe that the silo-based version will be deployed later this year. If there have been a sufficient number of tests* of the mobile version, the first land-mobile SS-X-16 units could be technically ready for deployment at any time. It is possible that the Soviets may wish to show the US a mobile SS-X-16 in the near future for political effect, depending on their view of the progress of SALT Two. We think more likely, however, that mobile deployment will not begin until at least 1976. Assuming that deployment begins in late 1976 or 1977, our best estimate is that the Soviets will have 100 mobile SS-X-16 launchers in the field by 1980. If the Soviets choose to emphasize survivability of their strategic force to a greater extent than we project in our best estimate, the land-mobile ICBM force could be nearly 200 launchers by 1980. The Soviets are capable of deploying more, say 100 launchers a year, if they increase production rates.

In addition, the Soviets are developing a new IRBM, the SS-X-20 [REDACTED] and probably intend to deploy a mobile version. The SS-X-20 apparently was designed by the same team that designed the SS-X-16 and both missiles probably are produced at the same facility. The SS-X-20 apparently consists of the first and second stages of the SS-X-16 with some modifications, and a similar post-boost vehicle. The SS-X-20, although smaller than the SS-X-16, may use the same size canister. Thus the vehicles and ground support equipment (GSE) for both systems could be similar.

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There have been 27 tests of the SS-X-16 to date and we believe that some have been from silos and others from mobile platforms.

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We believe that the SS-X-20 is MIRVed with three RVs, each probably weighing as much as 1,000 pounds. It is highly unlikely that the SS-X-20 MIRV would be transferred directly to the SS-X-16, since carrying a payload this large would limit the SS-X-16 to a range less than 3,000 nm. We cannot rule out the possibility that the SS-X-20 PBV, with fewer or smaller RVs, could be transferred to the SS-X-16, with additional testing.

Other Mobile Programs

[REDACTED]

US Mobile Missile Programs

US studies of mobile ICBMs are of interest here because they shed further light on the feasibility of such systems and the verification problems that might arise, and the potential impact of counting roles or collateral constraints on US programs.

Land-Mobile Missiles

US involvement in the development of land-mobile ballistic missiles has been primarily in the tactical area. Included in this category are the Honest John, Lance, Pershing, and Sergeant missile systems. The Pershing missile, which became operational in 1962, has the longest range (115-460 miles) of any of the tactical systems. The Sergeant, which was deployed in 1961, has a maximum range of 85 miles. The Honest John and Lance missiles have a range capability less than 30 miles.

The US first considered land-mobile basing for intercontinental ballistic missiles in the late 1950s when the Minuteman system was in its early developmental stages. At that time the Minuteman system was conceived as a mixed force of silo-based and rail-mobile ICBMs. The rail-mobile part of the concept, which was designed to operate on existing railroad networks, was subsequently dropped in order to reduce system cost.

Since that time a wide variety of land-mobile concepts have been postulated as a hedge against potential vulnerability of the fixed based system. Only recently, however, has a systematic comparative evaluation been made of these concepts. Under the land-mobile portion of the Advanced ICBM Technology (MX) program, the field of basing options has been narrowed to three concepts: shelter based, pool, and buried trench. In the screening process several basing options, including the road-mobile and offroad-mobile concepts employed by the Soviets, have been discarded as impractical for deployment in the limited land areas available in the US. The system concepts which have survived the screening process to date are similar in two respects: (1) they all depend on a combination of hardness and location uncertainty for survivability; and (2) they would all be deployed in a relatively small well-defined area.

In spite of the continued interest in land-mobile ICBMs very little actual development or testing of these systems was accomplished prior to initiation of the Advanced ICBM Technology (MX) program in 1973. Under this program the technology necessary to support a land-mobile program is being developed. Particular emphasis is being placed on guidance, missile canisterization, and transporter-launcher technology.

Air-Mobile Missiles

In addition to land-mobility the US has interest in the air-mobile ICBM concept as a means of maintaining survivability against future threats. The air-mobile concept gained significant stature with the advent of the wide body jets which are capable of large payloads and long endurance times. Although the US has not yet initiated a full scale development program, work is being conducted under the Air Force Advanced ICBM Technology (MX) program to develop the supporting technology. The technical feasibility of such a concept was demonstrated in late 1974 with the short-burn launch of a MM I

missile dropped from a C-5A aircraft.

The concepts currently under consideration include air-alert, strip-alert, and a combination air/strip alert system which increases its alert rate as the threat increases. The primary missile configurations under consideration range from 80,000 to 170,000 pound gross weight with primary interest in a common missile which could be utilized in an air-mobile, land-mobile, or silo-based concept.

Sea-Mobile Missiles

Serious consideration of sea-based ballistic missiles began in 1956 with a joint Army-Navy project (Jupiter 5) to develop an IRBM capable of either land or sea basing. While cruise missiles were then deployed in both surface and submarine platforms, surface ship basing for Jupiter was generally favored because of submarine structural problems and earlier availability of the surface platform.

The conception of the much smaller POLARIS greatly eased the submarine structural problems, permitting missile compartments to be inserted into submarine hulls already under construction. Surface versions were also planned, and several ships, including an Italian cruiser, were deployed with space provisions for back-fitting POLARIS. The surface version of POLARIS was subsequently abandoned, however, in favor of an all submarine fleet.

Since the deployment of the POLARIS system, studies of alternative sea-mobile basing modes have continued but at a much lower level of effort. These studies generally tended toward (1) sea surface launchers, either encapsulated or free floating, (2) seabed or submersible systems, including missiles up to 20,000 pound throw-weight, and (3) deceptive basing of ballistic missiles on ships that could not be distinguished as missile carriers.

Current Navy studies (other than those directly supporting Trident) continue to reevaluate available technology with the objectives of both diversification (to provide capabilities complementary to Trident and land-based systems) and of economy (to provide cheap, effective and if necessary "second line" systems to fulfill level quotas). Emphasis is on encapsulation of an ICBM range missile (such as Trident II) to give military effectiveness and flexibility both in deployment

area and type of platform.

It should be noted that, in general, most of the technology required for sea-mobile missiles carries over from SLBM programs. It is probable that a sea-mobile system adapting existing SLBMs could be deployed within 2 years given the availability of cargo ships.

Monitoring Problems

Mobile ICBMs present unique and difficult monitoring problems. The fact that mobile systems can be hidden and readily moved considerable distances from support bases* complicates the tasks of detecting and counting deployed missile launchers. Firing positions need have no discernable signatures and the required transportation routes may not have any unique characteristics other than a requirement that they must be able to support the missile and related equipment.

Accounting for mobiles probably will be more an estimative process than for fixed ICBM and SLBMs. [REDACTED] may never be capable of directly counting the number of [REDACTED]

For example, we may never observe all or even most of the launchers or ICBMs in a mobile ICBM support base at one time, particularly if some equipment is stored under cover. Nor could we be certain that each garrison would have the same number of missiles in it. [REDACTED]

In addition, since mobile ICBM launchers probably can be reloaded we will have the additional problem of monitoring missile transport equipment and storage areas to determine the total number of missiles which a Soviet mobile ICBM unit could launch. However, this is also true of soft, fixed sites and possibly for the new canisterized missiles.

However, the development and deployment of mobile, long-range ballistic missile systems would be a considerable task. Such systems require tests both of the missiles and associated equipment. The logistics

* The Interagency Intelligence Report on the SS-X-16 estimated that the Soviets probably would deploy land mobile SS-X-16s up to 50 nm from a support base.

security, and communications problems associated with mobile systems are greater than with fixed systems and, as a result, a network of support facilities would be required. [REDACTED]

Deployment Options

In an overt deployment scenario, the Soviets would not take special pains to hide the fact that mobile missiles were deployed. Some believe that the Soviets might adopt operating practices which would assist, rather than hamper our monitoring efforts. They believe that the Soviets would view their mobile missiles as a deterrent rather than as a first-strike force and, in order to enhance its deterrent value, would take steps to ensure that the US could maintain a fairly accurate count on mobile missile launchers. Others believe that, even if the fact of mobile missile deployment were overt, concern over survivability would give the Soviets an incentive to alter their operating practices somewhat, with a consequent increase in our uncertainty about the numbers deployed.

If the Soviets attempted to deploy mobile missile launchers in excess of the agreed limit, the goal would be to deceive the US as to the number of launchers deployed. Such a deployment scheme could range from simple camouflage to an elaborate and costly deception effort and might involve attempts to hide mobile ICBM launchers or to disguise them as other objects, including shorter range missiles not covered by the SAL agreement.

It is possible, of course, to combine these options and to deploy part of a force overtly and part covertly.

Land-Mobile ICBMs

The paragraphs below, and the table on the following page, outline our monitoring capabilities under various Soviet land-mobile ICBM deployment options.* The options considered are not all that could be conceived, but represent a likely range of deployment schemes, given

* Judgments on monitoring confidence are scenario-dependent. Throughout this paper the assessments of uncertainty in estimating mobile ICBM deployment levels represent the views of CIA and DIA. These assessments were made on the basis of subjective estimates by intelligence analysts and of subjective statistical analyses [REDACTED] All other agencies doubt that monitoring uncertainty can be quantified sufficiently to warrant presentation of specific levels of uncertainty.

Examples of Land-Mobile ICBM Monitoring Capabilities

Deployment Options	A	B	C	D
Description	Fixed support base, presurveyed open launch sites. (Occupation by launcher observable)	Presurveyed closed launch sites, e.g. closed shelters. (Occupation not observable)	Concealed Deployment	
Soviet Goal	Improve survivability while maintaining maximum control over force. Deception not a major consideration.	Improve survivability. Might be used in an effort to conceal the number of launchers deployed.	Maximize survivability. Conceal fact of deployment or number deployed	
Time until Detection of Deployment	A year or less.	A year or less.	1-2 years.	
Uncertainty as to number deployed	Depends on deployment scenario. CIA and DIA estimates uncertainty to be --Factor of three or more for small deployments. --About 100 launchers or more in likely deployment scenarios. Possibly smaller error for large deployment.	Could identify most shelters but would be unable to determine directly how many were occupied.	Might be able to estimate number of missiles produced, but not necessarily number of launchers.	

different assumptions about Soviet goals. Elaborate, costly deception scenarios are considered unlikely.

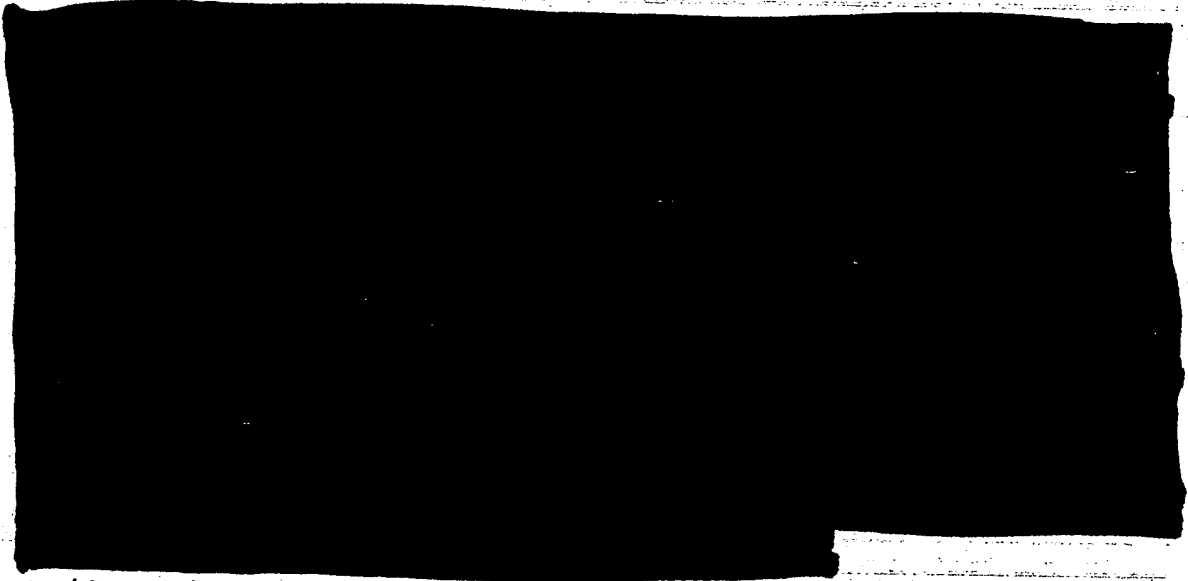
Option A. [REDACTED]

[REDACTED] If the Soviets do not undertake any deception or concealment measures, we believe that we could recognize deployment of new land-mobile ballistic missile systems within a year. By this time they could have deployed 25 to 100 launchers, depending on their force goals and the rate of deployment they choose. Our ability to estimate the extent of deployment would vary with time and with the number of launchers deployed. CIA and DIA estimate that at the beginning of the deployment program, or if the level of deployment is small, we probably could estimate the extent of deployment to within about 100 launchers after about 200 had been deployed; they believe that with larger deployments, we might still have to allow for the possibility that as many as 100 launchers might remain undetected. [REDACTED]

Option B. Were the Soviets to use the closed shelter-base concept -- building a number of missile shelters but occupying only some -- we probably could identify the shelters but would be unable to determine directly how many were occupied. [REDACTED]


Option C. If the Soviets made a major effort to conceal land-mobile ICBM deployment from detection by national means, we probably would be able to detect the fact of deployment after a year or two, and up to 100 had been deployed, but we have no basis for estimating confidently how accurately we could determine the number of launchers deployed. We might be able to estimate the number of missiles which could have been produced between the initiation of production and our detection of deployment but we might not know the relationship between that number and the number of launchers in the field. For example, if we were to detect concealed deployment of the SS-X-16 within the next two or three years, CIA and DIA estimate that the cheating potential probably would be [REDACTED]

on the order of 150 missiles. Later in the period envisioned for a new SAL agreement, they believe that this number could exceed 500 missiles.



Rail-Mobile ICBMs

If the Soviets were to deploy a rail-mobile ICBM, we probably could detect it within a year of so. Our ability to estimate the force level would depend on several factors:

- whether new logistic bases and rail spurs for launch points were being constructed;
 - the extent of the dispersal area;
 - whether missile trains could be distinguished from freight and passenger trains;
 - the extent of concealment measures; and
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The margin of error in estimating rail-mobile deployment probably would be comparable to that for land-mobile ICBM deployment.

Water-Mobile Missiles

The problem of monitoring ICBM launchers on surface ships and barges is still being evaluated. Our preliminary estimate is that an overt Soviet program for surface

ship launchers probably could be detected within several months after it began. Depending on the manner of construction or conversion of these ships, we might have considerable uncertainty about the number of missiles carried by each. An overt program to construct ICBM carrying barges for operation on inland waterways might not be recognized for a year or so after its inception, and by that time a dozen or more craft might have been produced.

If the Soviets were to convert merchant ships to carry missiles under the guise of routine overhaul activity, we probably could detect it, but this might take a year or more and by the time several ships could be available for operations. A similar program for ICBM-carrying barges -- which we consider highly unlikely -- might not be detected for several years.

Similarly, if the Soviets were to develop submersible missile capsules that could be towed by or launched over the side of existing surface ships the detection and monitoring of such systems would be difficult.

Air-Mobile Missiles

The problem of monitoring Soviet air-mobile ballistic missile deployment probably would not arise until near the end of the proposed SAL agreement. If such a program were undertaken, we almost certainly would be able to determine that a long range air-mobile ballistic missile was being developed, identify the types of aircraft which could carry it and estimate how many missiles each aircraft could carry. Unless a specifically designed aircraft were used, we probably would not be able to ascertain how many aircraft capable of carrying such missiles were actually armed with them. Thus, our monitoring uncertainty could be as high as the number of aircraft capable of carrying air-mobile ballistic missiles, but not counted as ballistic missile carriers, times the number of missiles which each could carry.

Collateral Constraints

While collateral constraints cannot eliminate the verification problems described above, certain constraints could mitigate some of these problems. This section presents collateral constraints which could deal with

such problems as the mobile IRBM/ICBM ambiguity. Each of the constraints is analyzed in terms of its contribution to verifiability and its effect on US and Soviet programs and options, and an estimate is made of its negotiability. Some of the constraints are presented in the form of counting rules, a form which may slightly improve their acceptability to the Soviets.

Land-Mobile Missiles

Constraint No. 1: Mobile IRBM/ICBM Ambiguity

This constraint has been included in article III, paragraph 5 of the US draft treaty: "The Parties undertake to consider as subject to the aggregate limitation set forth in this article all land-mobile ballistic missile launchers compatible with launching an ICBM."

a. Contribution to Verification. If the Soviets accepted this counting rule, it would reduce possible confusion and misunderstanding with respect to deployment of land-mobile IRBMs.

b. Effect on US Programs and Options. This constraint would have no effect either on current US programs or on plausible future US deployment options.

c. Effect on Estimated Soviet Programs and Options. If the SS-X-20 IRBM uses the same size canister as the SS-X-16 ICBM, and if the transporter-erector-launcher (TEL) vehicles for both are similar, this counting rule would require the Soviets either to change their mobile SS-X-20 launchers in some way so as to make them clearly not capable of launching ICBMs, or to agree that these IRBMs would be included in the aggregate ceiling. They may well be reluctant to do either of these.

d. Negotiability Estimate. Early in SALT I (11/24/69) the US proposed restrictions on IRBMs because they might be indistinguishable from ICBMs, and the Soviets refused to accept such a provision (e.g., on 12/5/69). It is likely that they will resist this counting rule unless it is packaged with some significant quid pro quo.

e. Summary. The land-mobile IRBM/ICBM ambiguity may well prove to be a serious verification problem, and this

counting rule would deal effectively with it. However, the Soviets will probably be reluctant to accept this constraint.

Constraint No. 2: Shelter basing*

"If mobile ICBM launchers are deployed in shelters, provisions must be made for eliminating the additional uncertainty in verification of deployment levels by national technical means introduced by the deployment mode."

a. Contribution to Verification. "Shelter basing" ("Shell game") includes any scheme for concealing the location of land-mobile ICBMs, e.g. hidden in hardened shelters or under canvas canopies. The basic concept of shelter basing is to deploy such a large number of shelters that the adversary does not have enough warheads to destroy them all, and that he does not know which shelters contain missiles. In the absence of some procedure which allows the other side to count the ICBMs with confidence, such basing directly violates the undertaking "not to use deliberate concealment measures which impede verification by national technical means of compliance with the provisions" of the agreement.

Shelter basing could lead to very large uncertainties in our estimates of the actual number of Soviet ICBMs. For example, if the estimate is based only on the number of shelters, a Soviet deployment of only 200 shelter-based ICBMs, each with ten shelters, could result in an uncertainty in our estimate of their land-mobile deployment as high as 1800. Based on other evidence, however, we probably could narrow our uncertainty to less than this outer limit.

b. The Effect on US Programs and Options. There has been some interest in maintaining an option for future deployment of land-mobile missiles which would be deployed in a relatively small area and depend on hardness and location uncertainty for survivability. Under the MX program, the field of land-mobile basing

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The JCS and OSD representatives point out that this constraint, in that it applies only to shelter based mobile concepts which are more likely to be deployed by the U.S. and less likely for the Soviets would impact U.S. freedom of action more severely than Soviet and therefore is not in the net U.S. interest.

options has been narrowed to three concepts: shelter-based, pool, and buried trench. The proposed counting rule would not rule out such systems but would require that they incorporate acceptable procedures for enabling the Soviets to count the number of ICBMs deployed.

c. Effect on Estimated Soviet Programs and Options.

At this time we do not know whether or not the Soviet plans for initial land-mobile ICBM deployment involve shelter basing. In any case, they may employ such a basing mode sooner or later if allowed to do so by the SALT agreement. (OSD and JCS believe that present US analysis suggests that such an option would not be cost-effective for the Soviets and is therefore unlikely.)

d. Negotiability Estimate. The Soviets may well be willing to accept it, particularly if it does not impact on their current land-mobile program.

e. Summary. This provision would solve a major verification problem, however it would constrain US flexibility in design of shelter based systems.*

f. Alternative Approach. The U.S. and Soviet draft texts contain obligations not to use deliberate concealment measures which impede verification by national technical means of compliance with the provisions of the agreement. An alternative to proposing a separate counting rule on deceptive basing would be to interpret this agreed language on deliberate concealment measures to prohibit the use of shelters or other deceptive deployment techniques which would preclude counting the number of missiles deployed. The side deploying such a system would have to incorporate features which allow the number of missiles deployed to be counted.

Constraint No. 3: Geographical Deployment Limits

"Each Party undertakes not to deploy land-based mobile ICBMs outside of _____ circular deployment areas, each of which shall have a diameter of no more than _____ kilometers. Each Party agrees to notify the other Party of the geographic coordinates of the center of each such deployment area within thirty days after initial deployment takes place."

* See OSD/JCS footnote to this section.

a. Contribution to Verification. While a provision such as this would not eliminate the serious counting problems referred to earlier, it could be of considerable assistance, since the detection of even a single deployed mobile ICBM launcher outside the permitted areas would be evidence of a violation.

Inside the declared deployment areas we would concentrate on establishing the best estimate we could as to the number of land-mobile launchers actually deployed. The smaller the permitted deployment area, the easier it would be to focus our resources on this effort.

This constraint would retain much of its value even if the Soviets accepted only the first sentence and rejected the second sentence regarding notification.

b. Effect on US Programs and Options. In the event that the US should decide to deploy a land-mobile ICBM system, we would be unlikely to deploy an off-road mobile or road mobile system because of the limited land area available in the US for such deployment. Since US deployment would be in a relatively small area, this provision would not affect US deployment options.

c. Effect on Estimated Soviet Programs and Options. Since we do not know the Soviet land-mobile deployment plans, we could propose this provision to the Soviets leaving blank the number and size of the deployment areas and request that they suggest appropriate numbers which they would find satisfactory. Such a negotiating approach would eliminate any legitimate Soviet objection that we were constraining their freedom to design their own force deployments. We would also make clear that if the Soviets should decide at some future time to move one of their deployment areas to a new location they would have the freedom to do so under this provision.

d. Negotiability Estimate. It is difficult to predict how the Soviets would react to the first part of this provision, since allowing them to fill in the blanks should have considerable appeal to them. The last sentence, with respect to notification, may prove harder to negotiate, since the Soviets have indicated in the past some distaste for notification.

e. Summary. This provision would contribute to our verification capabilities, but only to a limited extent. The US would have nothing to lose and something to gain by proposing it, but should not pay a high price for it.

b. Effect on US Programs and Options. At present the US does not have an air-mobile ICBM program defined. There has been some interest in maintaining an option for such a system. If we decide at some future time to deploy an air-mobile ICBM by modifying an existing aircraft type, this constraint would require that the modification be sufficiently conspicuous as to make the modified aircraft clearly distinguishable from the unmodified aircraft. We would be more likely to develop a new type of dedicated aircraft for this purpose, with fast take-off capability to improve its survivability. In that case, its distinguishability would probably be adequate.

c. Effect on Soviet Programs and Options. If the Soviets decide to deploy an air-mobile missile system, the same considerations would apply as for the US.

d. Negotiability. The Soviets have expressed concern over the possible US deployment of air-mobile ICBMs. Their draft treaty of 2/1/75 prohibits use or conversion of "transport airplanes" as delivery vehicles for nuclear weapons. Accordingly, they would probably accept this provision.

e. Summary. Although not of immediate concern, this provision would be in the US interest from a verification standpoint, and the Soviets would probably accept it.

Sea-Mobile Ballistic Missiles*

Constraint No. 5: Distinguishability of Vessels Carrying Ballistic Missiles

"Each Party undertakes to limit deployment of sea-launched ballistic missiles to vessels (surface or submarine) which are clearly distinguishable from other vessels by virtue of unique observable features. Missile launchers on such ships would be fixed within the superstructure of the vessel and not reloadable from stores within the vessel."

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These provisions could be expanded to include SLCMs which are limited by the agreement.

a. Contribution to Verification. This provision would place the burden of making sea-launched ballistic missile carriers clearly distinguishable from other vessels on the side deploying the systems. It would assist the counting of overtly deployed systems and reduce the possibility of covertly deployed strategic missiles on attack submarines and surface ships. It would also provide a basis for challenge if even one such deployment were detected.

b. Effect on US Programs and Options. Since the US has no plans for deploying strategic missiles on surface ships and or to deploy separately encapsulated or canisterized SLBMs, this provision would have no effect on currently planned programs. Future options to convert submarines from SLBM carriers to other uses, because of aging or as part of general force reductions, could be affected. However, conversion procedures acceptable to both sides could probably be worked out if necessary.

c. Effect on Soviet Programs and Options. There is no evidence that the Soviets intend to deploy ballistic missiles on surface ships or to deploy SLBMs on any submarine other than those specifically designed for that purpose. Therefore, this provision should have no effect on known Soviet programs. As discussed above, future options for converting SLBM carriers to other uses could be affected.

d. Negotiability. Since this provision would not affect either side appreciably, the Soviets should be willing to accept such a constraint.

e. Summary. This provision would be in the US interest from a verification point of view and should be acceptable to the Soviets.